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PTOL-328 (Rev. 2/93)

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1. Claim 95 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

2. Claim 85 is directed to a virtual reality generated for display of financial information. Claim 95 which depends indirectly from claim 85 is however directed to display of a simulated cockpit. The Examiner respectfully asserts that it is unclear how display of a cockpit relates to a financial system. Claim 95 is therefore rejected as vague and indefinite.

3. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

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4. Claims 85-125 are rejected under 35 U.S.C. § 103 as being unpatentable over "Cyberarts: Lanier of VPL on 'voomies,' and VR's future" by Linda Rohrbough and "Virtual reality: a status report" by Linda Jacobson in further view of 'Virtual Reality offers growing opportunity for risk takers' by Len Hindus; 'Virtual Reality is almost real' by Paul Saffo; PV-Wave for Financial Applications; PV-Wave Command Language; PV-Wave Point and Click Visual Data Analysis Software.

5. The Rohrbough article discusses trends in use of virtual reality (VR). The article discloses several environments which at that time made use of virtual reality. These environments include industrial applications such as building design, product marketing schemes, product designs and financial modeling. According to Rohrbough, use of virtual reality to model abstract information such as that found in financial databases "is being done because a physical module is easier for people to understand".

The Jacobson article is also directed to a discussion of trends in the world of virtual reality. This article also suggests financial modeling as one use of virtual reality. Specific examples of such modeling given include stock market predictions, sales forecasts, and analysis of industrial problems.

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Thus, the prior art clearly suggests use of a virtual reality generator to display financial information in a virtual reality world. While neither article teaches the details of the virtual reality system needed to implement this particular application, they both suggest that the level of skill for the ordinary artisan at the time of publication was such that no undue experimentation would have been needed. See for example, the Jacobson and Rohrbough articles which disclose several existing virtual reality applications by the University of North Carolina and VPL Research.

In addition, the Examiner directs attention to the Hindus and Saffo articles as well as those cited by the Protestor relating to PV-WAVE for further evidence of the level of skill in the art. Thus, the ordinary artisan would have been able to generate 3D models of a desired environment, including modeling of financial data, for display to the user and to not only display these environments to the user but to do so in a fashion which allows the user to "navigate" through it. As also disclosed by the prior art, the skilled artisan would have been able to generate 3D models of financial data.

The Examiner asserts that a virtual reality system which models financial data would have included a virtual reality generator module, as recited in claim 85; the input module, in order to receive information for generating the required models,

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and a user interface to receive information on how models are to be displayed, (i.e., the display parameters).

The invention as recited in claim 85 differs from the above cited art in that it explicitly recites use of financial analytic systems and filter parameters used by user interface means. The Examiner respectfully asserts that parameters which determine which elements of models are to be displayed to the user (i.e., filter parameters) would be included in order to show only selected items.

Claim 85 is therefore rejected.

6. Use of stereoscopic head-mounted display devices in VR is well known. Claim 86 is rejected.

7. The Examiner respectfully asserts that if financial information is displayed in the VR medium then it would have been displayed in metaphors. Claim 87 is rejected.

8. Claims 88-89 recite specific metaphors. The Examiner respectfully asserts that use of geometric shapes to model financial data would have been obvious to one of ordinary skill in the art, because it provides the user with a structure, as cited by Rohrbough, which is easier for users to understand. Thus, specification of geometric primitives in general and

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polygons in particular would have been obvious to one of ordinary skill in the art, because it provides the user with a physical object to associate with the financial data.

9. Claims 90-91 require metaphors to be rotatable and to have variable luminance. The Examiner respectfully asserts that in order for the user to see the entire shape, the metaphor must either rotate and the user stand still or the user walk around it. Selection of either technique would not create a patentable difference as they are the most obvious means of allowing the user to see the entire metaphor. Variable luminance would allow shading (a well known technique in 3D imaging) and would have also served to highlight a metaphor of interest. Claims 90-91 are rejected.

10. The Examiner respectfully asserts that it would have been obvious to allow the user to select which metaphors or representations the user wished to more closely explore. As discussed above, rotation of the metaphors would have been an obvious technique for presenting the entire metaphor to the viewer. Claim 92 is rejected.

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11. The Examiner respectfully asserts that flashing of displayed data is a well known method of highlighting such data for the viewer. Claim 93 is rejected.

12. As addressed in the rejection of claim 85, the prior art clearly suggests use virtual reality for display of financial data. Data relating to financial instruments is one well known type of financial data. Further, the Jacobson, see the final page of the article, suggests use of virtual reality for stock market predictions. Claim 94 is rejected.

13. Jacobson discloses as one environment a CAD/CAM application Boeing protospace "in cockpit to design for crews". Claim 95 is rejected. The Examiner respectfully asserts that use of wire frame displays (i.e., grid of subregions) CAD/CAM applications is well known. Claim 96 is rejected.

14. The Examiner respectfully asserts that once the idea of using virtual reality for display of financial information is known, the particular data and the particular format used to display the data becomes a design choice of the user. Further, display of financial information for a single industry or market including more in depth display of market data for this industry

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or industry data for this market is well known. Claim 97 is rejected.

15. Use of a VR medium for display of stock related data is disclosed in the Jacobson article. The Examiner respectfully asserts that in order to select which stock and which attribute of that stock would be displayed to the user, related data would have to satisfy the filter parameter. Claim 98 is rejected.

16. As discussed above, the Jacobson article suggests use of virtual reality for stock market predictions. Thus, it would have required no hindsight to make use of this medium for stocks, bonds, and commodities. Use of the attributes recited in claim 99 to represent financial information is well known, see for example the PV-WAVE articles. As discussed above, it would have been obvious to make use of a virtual reality medium for presentation of stock related data. Claim 99 is rejected for obviousness.

17. The Examiner respectfully asserts that one skilled in the art would have been motivated to update the images as often as necessary in order for it to appear realistic and uninterrupted. Claim 100 is rejected.



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18. The references applied in the rejection of claim 85 disclose use of virtual reality for a variety of applications. One skilled in the art would have been motivated to allow simultaneous display of these environments in order to allow a plurality of users to use the system at once. This could be implemented via use of adequate computing means and would have been motivated by the desire to increase customer convenience and satisfaction. Claim 101 is rejected.

19. The skilled artisan would have been motivated to allow a use to select a desired metaphor for a more in-depth analysis in order to allow the user to focus on information the user decides is of more interest. Any information specific only to that metaphor and which could not easily be incorporated into the display could have been presented in a hierarchial manner (i.e., retrieved by selection of that particular metaphor). Claim 102 is rejected.

20. Presentation of audio information in a virtual reality medium is well known. Motivation to do so in a financial environment would be to present orally information about the metaphor thereby providing additional information to the user. Claim 103 is rejected.

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21. Limitations in claims 104 and 106 are found in the references as applied to claim 85 above. Further, the Examiner respectfully asserts that data would have been continuously modified, updated and displayed to the user in order for the display to appear smooth and realistic.

22. The Examiner respectfully asserts that one skilled in the art would have been motivated to update the images as often as necessary in order for it to appear realistic and uninterrupted. Claims 105 and 107 are rejected.

23. The Rohrbough article discloses use of a financial database for supply of data needed for the VR system. The Examiner respectfully asserts that it is well known for the ordinary artisan to make use of a database for storing financial data. Further, data which is to be displayed may be stored for subsequent retrieval and processing or displayed on the fly (i.e., as it is generated). Motivation to display data as it is generated would have been the desire to display the most current form of data. This is most important in rapidly changing environments (e.g., stock markets). Claims 108-110 are rejected.

24. Preprocessing of data by an analytic system prior to its receipt by the input module would occur via use of a means, such

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as PV-WAVE, for generating 3D representations of the data. Further, the Examiner directs attention to financial analysis systems such as the CAPRI, developed by Applicant, and available to the public more than a year before the effective filing date of the invention. Claim 111 is rejected.

25. Use of knowledge based and neural network systems for analysis of financial data is well known. Claims 112-113 are rejected.

26. Use of a headset for control of movement simulation and use of monitors as well as head mounted display means for presentation of data to the user are well known in arts which make use of VR. Claims 114 and 116-117 are rejected.

27. Use of VR for display of financial information has been discussed above. It would have been obvious to make use of plural metaphors for a subset of the data since metaphors would be necessary for display of the data in 3D form. Further, it would have been obvious to make use of only a subset of the data since the user may only be interested in a portion of the data. Claim 115 is rejected.

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28. Claim 118 recites limitations found in claims 104, 106, and 108 and is rejected on the same basis.

29. Claims 119-122 recite subject matter found in claims 100-102 and are rejected on the same basis.

30. Claim 123 recites receiving information in packets and the limitations of claim 85. It is known in the computer arts to receive information in packets or as information flowing as a form or report. It would have been obvious to one of ordinary skill in the art to receive information in packets, because it allows access to information stored in a form or report format.

31. Claim 124 is rejected on the same basis as claims 85, 109 and 111.

32. Claim 125 recites limitations found in claims 104 and 123 and is therefore rejected on the same basis.

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***Double Patenting***

33. Claims 85-125(108) are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 34-62 of co-pending application Serial No. 07/954,755 referred to as (775). Although the conflicting claims are not identical, they are not patentably distinct from each other because independent claim 34 is a broader version of the narrower independent claims in (108), where the narrowing limitations are obvious or well-known in the art.

This is a *provisional* obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

34. Claim 85 (108) differs from claim 34(775) in that claim 85 specifically recites real-time financial data. Jacobson discusses real-time analysis under "DIGITALIZE, THEN VISUALIZE". It would have been obvious to have real-time analysis of financial data, because it allows the benefits of known computer advancements in the financial arena and gives the user the a more accurate system. Examiner asserts movement of the user in virtual reality environment is a feature found in any virtual reality systems.

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35. The limitations of claim 85(108) "enables the user to simulate movement through financial data" is equivalent to "means for simulating movement" of a virtual reality world of claim 36 (775).

36. The limitations of claim 86(108), except for use of stereoscopic head-mounted display, are recited by claims 34 and 36(775) as applied to claim 85, and based on the well-known use of stereoscopic head-mounted display devices in VR.

37. The limitations of claims 88, 87, 89, 90, 91, 92, 93, 94, 95, 96, 97, 99, 100, 101, 102, 103 and 98(108) are recited in claims 38, 37, 39, 40, 41, 42, 46, 47, 48, 49, 50, 57, 59, 60, 61, 62, and 56 (775) respectively.

38. The limitations of claim 97(108) are recited in claim 51(775), except "a single market". An industry and a market would have been an obvious modification for one of ordinary skill in the art, because an industry and a market are similar in scope and thus obvious.

39. Claim 104(108) differs from claims 34 and 36(775) as applied to claim 85 above, in that the input module continuously receives information. It would have been obvious to one of ordinary skill

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in the art to receive information continuously to present data in a real-time fashion as discussed above for claim 85(108), because it allows the user to have access to the most current information and takes advantage of well-known computer advancements making the systems more accurate.

40. The limitations of claim 106(108) are met by the limitations of claims 34 and 36(775) as applied to claim 85(108) above.

41. The limitations of claims 108-110(108), except the use of a database, and real-time data feed are addressed in the limitations of claims 34 and 36 (775) as applied to claim 106(108) above. The Rohrbough article discloses use of a financial database for supply of data needed for the VR system. The Examiner respectfully asserts that it is well known for the ordinary artisan to make use of a database for storing financial data. Further, data which is to be displayed may be stored for subsequent retrieval and processing or displayed on the fly (i.e., as it is generated). Motivation to display data as it is generated would have been the desire to display the most current form of data. This is most important in rapidly changing environments (e.g., stock markets).

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42. The limitations of claims 111(108), except for pre-processing, are addressed by claims 34 and 36(775) as applied to claim 106 (108) above. Preprocessing of data by an analytic system prior to its receipt by the input module would occur via use of a means, such as PV-WAVE, for generating 3D representations of the data. Further, the Examiner directs attention to financial analysis systems such as the CAPRI, developed by Applicant, and available to the public more than a year before the effective filing date of the invention.

43. The limitations of claims 112-113(108), except for knowledge based and neural networks, are addressed by claim 34 and 36(775) as applied to claim 106(108) above. Use of knowledge based and neural network systems for analysis of financial data is well known.

44. The limitations of claims 114, 116 and 117(108), except for display devices, are addressed by claims 34 and 36(775) as applied to claim 106(108) above. Use of a headset for control of movement simulation and use of monitors as well as head mounted display means for presentation of data to the user are well known in arts which make use of VR.



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45. The limitations of claim 115(108), except for a plurality of metaphors representing financial information, is addressed by claims 34 and 36(775), as applied to claim 106(108) above. Use of VR for display of financial information has been discussed above. It would have been obvious to make use of plural metaphors for a subset of the data since metaphors would be necessary for display of the data in 3D form. Further, it would have been obvious to make use of only a subset of the data since the user may only be interested in a portion of the data.

46. The limitations of claim 118(108), are rejected in view of the limitations of claims 34 and 36(775) as applied to claims 85, 104, 106, and 108(108) above.

47. Claims 119-122(108) recite subject matter found in claims 100-102(108) and are rejected on the same basis as applied above in view of claims 34 and 36(775).

48. The limitations of claim 123(108) are addressed in claims 34 and 36(775) as applied to claim 85(108) above, except receiving information in packets. It is known in the computer arts to receive information in packets or as information flowing as a form or report. It would have been obvious to one of ordinary

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skill in the art to receive information in packets, because it allows access to information stored in a form or report format.

49. The limitations of claim 124(108) differs from claims 34 and 36(775), as applied to claim 85 above, in that information is received from a database of financial information. The Examiner respectfully asserts that it is well known for the ordinary artisan to make use of a database for storing financial data and to access that stored information. Further, data which is to be displayed may be stored for subsequent retrieval and processing. Controllably displaying data would fall under user parameters as information to be selected by the user.

50. Claim 125(108) recites the same limitations as claims 34 and 36(775), as applied to claim 85(108), except packets of information and continuously updating, which was discussed in the rejection of claims 123 and 104(108) respectively.

51. The limitations of claims 105, 107, and 119 (108) are recited in claim 59 (775).

52. The limitations of claims 101 and 120 (108) are recited in claim 36 (775).

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53. The limitations of claims 121 and 102 (108) are recited in claim 37(775).

54. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris Butterworth whose telephone number is (703) 305-9771. The examiner can normally be reached on Monday through Thursday 8:00 A.M. to 5:00 P.M. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gail Hayes, can be reached on (703) 305-9711. The fax number for this group is (703) 305-9564 or 9565.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3800.

*CBB*  
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